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Cobra

DSSI to SCSI Adapter User's Manual

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eurologic

Eurologic/CMD Cobra GO NOGO List

Firmware B477

DigitalQPL

	Manufacturer	**Model**	**Capacity**	**Form Factor**	**RPM**	**Firmware**	**Comments**
CD-ROM Drives 512 bytes/sector only	Digital Equipment Corp	RRD43		5.25HH			Dual Speed
	Digital Equipment Corp	RRD44		5.25HH			Dual Speed
	Toshiba	XM5401		5.25HH			Quad speed
	Toshiba	XM5701		5.25HH			6X speed
DLT Tape Drives	Digital Equipment Corp	TZ87		5.25			20 GB / &#189; in. Cartridge
	Digital Equipment Corp	TZ877					140 GB Cart. system
	Quantum	DLT2000					20 GB Cartridge
	Quantum	DLT4000					40 GB Cartridge
	Quantum	DLT7000					70 GB Cartridge
8MM Tape Drives	Exabyte	8505XL		5.25L			14.0 GB with compression
	Exabyte	8200		5.25			2.0 GB
	Exabyte	8500		5.25			5.0 GB
	Exabyte	8500C		5.25L			10 GB with compression
4MM Tape Drives	Conner	4330NT		3.5			2 or 4 GB compressed
	Conner	4324NP		3.5			2 GB
	Hewlett Packard	35480A		3.5			2 GB - 4 GB compressed - DDS-1
	Hewlett Packard	C1533A		3.5			4 GB / 8 GB compressed DDS-2
	WangDat	3200		3.5			2 GB
	WangDat	3400		3.5			2 GB
3480 Type Tape Drives	Cipher	T480		8			2 GB - 18 track
	Fujitsu	2481		19			4 GB - 18 track/ EDRC compression
	Fujitsu	2483		8			2 GB
	Fujitsu	2680		19			10 GB/Cart - 36 track/compressed
	STC	4280		8			2 GB - 18 track
9 Track Tape Drives	Cipher	M995		19			1600 BPI or 6250 BPI
	Qualstar	3412		19			1600 BPI or 6250 BPI
	Overland	5612		19			6250 BPI
DEC Tape Drives	Digital Equipment Corp.	TLZ06		3.5			4mm Conner 4324
	Digital Equipment Corp.	TSZ07		19			9 track Cipher M995
	Digital Equipment Corp	TKZ08		5.25			2 GB EXB8200
	Digital Equipment Corp.	TKZ09		5.25			5 GB EXB8500
	Digital Equipment Corp.	TKZ60		8			2 GB 3480 Cartridge
	Digital Equipment Corp	TZ85		5.25			2.6 GB &#189; inch Cartridge
	Digital Equipment Corp.	TZ86		5.25			6 GB &#189; inch Cartridge
	Cipher	T826S		5.25			2.6 GB &#189; in. cart
	Cipher	T860S					20 GB &#189; in. Cart.
Narrow Disk Drives	Seagate	ST39102	8683 MB	3.5LP	10000	0003	Cheetah 9LP
	Seagate	ST39173	8683 MB	3.5LP	7200	4292	Barracuda 9LP
	Seagate	ST34502	4340 MB	3.5LP	1000	0004	Cheetah 9LP
	Seagate	ST34501	4339 MB	3.5LP	1000	0013	Cheetah 4LP
	Seagate	ST34573	4340 MB	3.5LP	7200	5766	Barracuda 9LP
	Seagate	ST19171	8683 MB	3.5	7200	0023	Barracuda 9
	Seagate	ST19101	8683 MB	3.4	1000	0014	Cheetah 9
	Seagate	ST118202	17366 MB	3.5	1000	0004	Cheetah 18
	Seagate	ST118273	17366 MB	3.5	7200	5744	Barracuda 18
	Fujitsu	MAB3091	8703 MB	3.5	7200	0107	Enterprise 18

Seagate ST39140 9.1GB 3.5"

No Go!

IBM DNES-309170 Narrow SE 9.1GB

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FCC Notice

Class A Computing Device: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warranty

BASIC WARRANTY—In the absence of any optional warranty or continuing provisions by formal agreement, CMD warrants its products in accordance with the schedules listed below. Purchaser hereafter mentioned refers at all times to the customer who purchased CMD product(s).

CONTROLLER WARRANTY—CMD warrants Controller products of its manufacture to be free from defect in material and workmanship for a period of one year from the date of shipment. During this period, if the customer experiences difficulties with a CMD Controller and is unable to resolve the problem via phone with CMD Technical Support, a Return Material Authorization (RMA) will be issued. Following receipt of an RMA, the Purchaser is responsible for returning the product to CMD, freight prepaid. CMD, upon verification of warranty, will repair or replace at its option the Controller in question, and will then return the product to the Purchaser, freight prepaid.

CABLE WARRANTY—All CMD provided cables are warranted for ninety (90) days from the time of shipment. Questionable cables should be returned to CMD, freight prepaid, where they will be repaired or replaced by CMD at its option and returned to the Purchaser, freight prepaid.

GENERAL TERMS—The above warranties shall not apply to expendable components such as fuses, bulbs, and the like, nor to connectors, adapters, and other items not a part of the basic product. CMD shall have no obligation to make repairs or to cause replacement required through normal wear and tear or necessitated in whole or in part by catastrophe, fault or negligence of the user, improper or unauthorized use of the product, or use of the product in such a manner for

which it was not designed, or by causes external to the product, such as, but not limited to, power failure or air conditioning. CMD's sole obligation hereunder shall be to repair or replace any defective product, and, unless stated, pay return transportation costs within the United States of America for such replacement. Purchaser shall provide labor for removal of the defective product, shipping charges for return to CMD and installation of its replacement. On-site services are not a part of this warranty. Above warranties are subject to change without notice.

RETURNED MATERIAL—Warranty claims must be received by CMD within the applicable warranty period. A replaced product, or part thereof, shall become the property of CMD and shall be returned to CMD at Purchaser's expense. All returned material must be accompanied by a Return Materials Authorization (RMA) number assigned by CMD. For RMA numbers call CMD at (714) 454-0800.

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Return and Repair Policy

Warranty Period

The following warranty period is from the date of shipment:

CMD Controller	One year
Cable	90 days
Drives	Manufacturer's warranty

Return For Credit

The allowable period of return for credit from the date of shipment is as follows

CMD Controller	Less than 30 days
Cable	Less than 30 days
Drives	Not applicable

Return for Repair

CMD Controller	
In-Warranty (Less than 1 year)	CMD offers a *15 working day turnaround repair service* at the cost of parts only. Defective boards will be repaired and returned to the customer within 15 working days from that date that CMD receives the board. CMD also offers two *in-warranty 24 hour expediting services:* *24 Hour Turnaround Loaner Service:* Under this policy, CMD will ship a loaner in 24 hours during regular working days to the customer for a charge of $100.00 per loaner. Upon receiving the loaner, customer must return the defective board to CMD within seven (7) days for repair. CMD will repair the defective board and return the board to the customer. Customer must then return the loaner in seven (7) days after the receipt of the repaired board. Approval for loaner service is based on credit verification. *24 Hour Turnaround Swap Service:* In the case that the defective board is within the first six (6) months of the warranty, CMD, at its own option, offers a 24 hour turnaround swap service. CMD will ship the same model of the board to customer within 24 hours during working days in exchange for the defective board. CMD will swap with a new board if board is not functional upon arrival. For all other cases, swap will occur with either a new or refurbished board for a charge of $200.00. CMD does not offer swap services for boards that are purchased more than six months from the date of shipment. Customer is responsible for returning the defective board to CMD within seven (7) days after receipt of the swapped board. The remaining warranty period shall apply to the repaired or swapped board.
Out-of-Warranty (more than 1 year)	CMD offers a *15 working day turnaround repair service* at a rate of $300.00 plus parts and freight for all out-of-warranty Controllers. CMD will repair and return defective controllers within 15 working days from the date that CMD receives the controller. CMD also offers an *Out-of-Warranty 24 Hour Turnaround Loaner Service:* Under this policy, CMD will ship the same model loaner in the 24 hour time frame of working days to customer for an additional charge of $100.00 plus freight per loaner. The loaner is for use by the customer during the period that the defective board is being repaired. Customer is responsible for returning the defective board to CMD within seven days after the receipt of loaner and returning the loaner in seven (7) days once the defective board is repaired and received. The approval of the loaner service is at CMD's option and based upon customer credit verification. CMD will extend warranty for a period of six (6) months on any out-of-warranty repaired board.

Cable	
In-Warranty (90 days)	Free swap
Out-of-Warranty (90 days)	Not applicable
Drives	
In-Warranty (per manufacturer)	Manufacturer charge only.
Out-of-Warranty (per manufacturer)	manufacturer charge plus $100 CMD handling.

Return for Upgrade / Update

CMD Controller	
In-Warranty (less than 1 year)	CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function; and a *free 15 working day turnaround ECO Field Upgrade* for all its boards. CMD will *upgrade* the hardware of its board to a higher function for a charge of the difference of list prices of the original and upgraded functions. CMD will also update its board to its latest firmware release at no charge to the customer. Boards will be upgraded/updated and returned to the customer within 15 working days from the date that CMD receives the board. CMD also offers *24 hour turnaround loaner service* as stated in "Return for Repair." The remaining warranty period shall apply to the updated board. For upgraded boards, CMD will extend warranty for a period of six months.
Out-of-Warranty (More than 1 year)	CMD offers a *15 working day turnaround different function upgrade service* for boards that can be upgraded to a higher function at a charge of the difference of list prices of two functions. CMD also offers a *free 15 working day turnaround ECO Field Upgrade* for all its boards. Boards will be upgraded/updated and returned to customer within 15 working days from the date that CMD receives the board. CMD also offers *24 hours turnaround Loaner Service* as stated in "Return for Repair." There will be no warranty extension for same function firmware update. For different function Hardware upgrade, CMD will extend warranty for a period of six (6) months.
Drives	Same as in "Return for Repair."

Shipping Charges

The following shipping charges apply to all REPAIR, SWAP, LOANER, and UPGRADE UNITS.

In-Warranty	
Domestic	Freight from CMD to customer is to be paid by CMD; freight from customer to CMD is to be paid by customer.
International	All fees are to be paid by customer (including custom duty and broker fees).
Out-of Warranty	
Domestic	All fees are to be paid by customer.
International	All fees are to be paid by customer (including custom duty and broker fees).

General Conditions

All goods returned to CMD including returns for credit, swap returns, loaner returns, and evaluation returns shall remain in good condition. Any damage or alteration done by the customer will result in a rejection or additional charge to the customer.

A customer who receives a board that is defective upon arrival must contact CMD Technical Support and obtain authorization before returning the board for repair or replacement. CMD Sales personnel must be consulted for authorization of returned goods for credit and/or evaluation.

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Chapter 1

Introduction

This chapter briefly describes the functions and summarizes the features of the Cobra DSSI to SCSI adapter. The succeeding chapters in this manual provide detailed information on installing, configuring and using the Cobra.

The Cobra Series

The Cobra series comprises three products: the CDI-4220 and CDI-4240 DSSI to SCSI adapters and the CDI-4204 cache module. Both the CDI-4220 and CDI-4240 provide a means for DSSI-based VAX and AXP computer systems to share a common farm of SCSI devices. The CDI-4204 cache module makes it possible to install up to 128 megabytes of cache on either Cobra series adapter.

This manual uses the name Cobra to refer to both the CDI-4220 and the CDI-4240, unless otherwise noted.

Features

The Cobra can control up to 21 SCSI devices—18 devices if you choose to use redundant Cobra adapters. These devices can be redundant arrays of independent disks (RAID), solid state disks, disk drives, tape drives, CDROMs or optical devices. For a complete list of supported devices, call CMD Technology and request the "Qualified Peripherals List" for the Cobra.

The Cobra is fully compliant with Digital's mass storage protocols, MSCP and TMSCP. There is no need for additional software drivers.

For faster read performance, the Cobra can be equipped with the CDI-4204 cache module. The CDI-4204 will accept one standard 72-pin SIMM, which can be from 4 to 128 megabytes in size. The Cobra's firmware permits you to control which devices are to be cached.

Utilities for formatting, qualifying and testing devices are available through the Diagnostics Utilty Protocol (DUP).

By connecting a monitor to the Cobra's dedicated RS232 port, you may view various displays designed to help you determine the controller's current status and configuration options at any given moment.

Specifications

■ **Table 1-1 Cobra Technical Specifications**

General	
Emulation	MSCP (DU) and TMSCP (MU)
Host Bus Interface	Digital DSSI
Peripheral Bus Interface	SCSI-1, SCSI-2, "Fast" SCSI-2
Maximum Cable Length	SCSI ≤ 5 MB/sec transfer rate: 6 meters (19.5 ft.) SCSI > 5 MB/sec transfer rate: 3 meters (9.9 ft.) DSSI: 25 meters (82 ft.)
Number of SCSI Devices Supported	CDI-4220: Up to 7 CDI-4240: Up to 21
Maximum Hosts Supported	CDI-4220: Up to 7 CDI-4240: Up to 14
Connector Type	DSSI: Dual row 50-pin male Honda SCSI: Dual row 50-pin BERG
Command Queuing	Commands from host: Up to 60 with seek optimization SCSI command tag queuing: Up to 64 commands per drive
User Interface	Dedicated RS232 console interface for setup, status monitoring and diagnostics
Host Connection Support	VAX 3300/3400, VAX 4000, AXP 4000, KFMSA and DEC 5400/5500
Operating System Support	VMS 5.4 and above OpenVMS AXP 1.5 and above OSF/1 1.5 and above

Environmental	
Temperature	Operational: 5° C to 50° C Non-operational: -40° C to +60° C
Relative Humidity	Operational: 10% to 85% non-condensing Non-operational: 5% to 90% non-condensing

Power Requirements	
Input Voltage	Without cache module: 5 VDC @ 1.5 amps peak With cache module: 5 VDC @ 2.5 amps peak

Physical	
Board Size	5.75" x 8.125" (W x D)

Chapter 2

CDI-4220 Installation

CDI-4220 Components

Figure 2-1 shows the location of the CDI-4220's DSSI and SCSI ports.

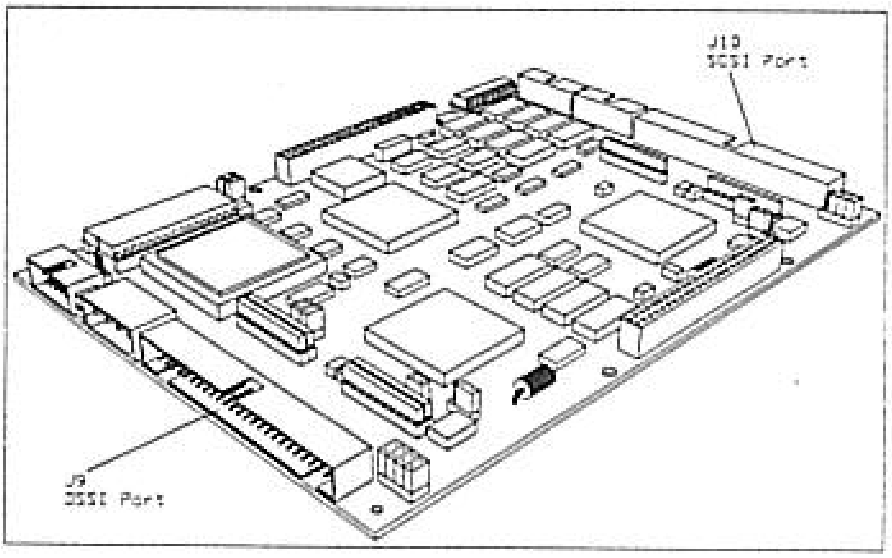

Fig. 2-1: CDI-4220 ports

Table 2-1 outlines the default configuration of the CDI-4220 adapter:

■ **Table 2-1 CDI-4220 Default Configuration**

DSSI Node ID	7
SCSI ID	7
On-board DSSI termination	No
DSSI term power supplied	Yes
On-board active SCSI termination	Yes
SCSI term power supplied	Yes

The remainder of this chapter describes how to change the default configuration of the CDI-4220's DSSI and SCSI ports.

DSSI Port (J9)

Figure 2-2 shows the components that determine the configuration of the DSSI port.

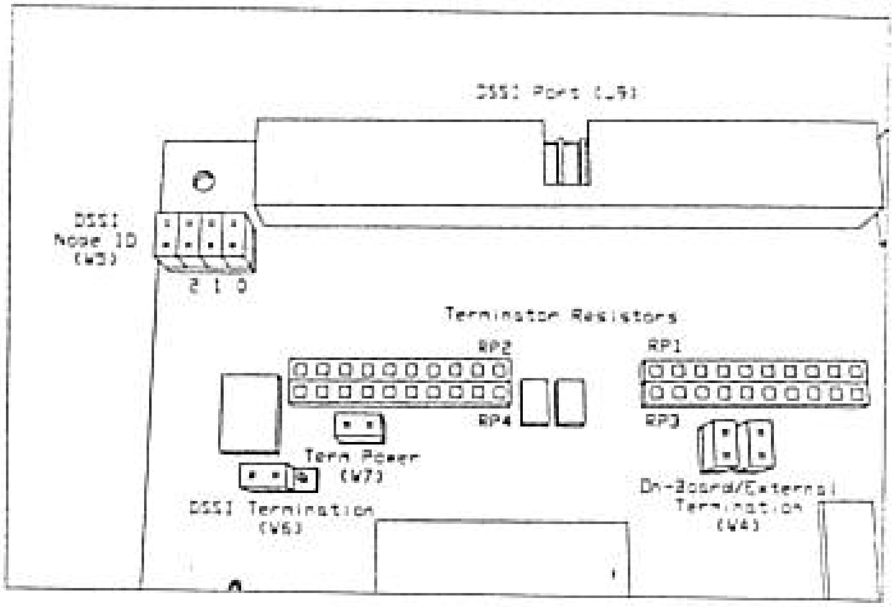

Fig. 2-2: CDI-4220 DSSI Port Configuration

DSSI Node ID

Jumper W5 determines the DSSI Node ID of the adapter. There are four positions on the jumper, labeled 0, 1, 2 and 3. Position 0 sets the least significant bit of the node ID, position 1 sets the next significant bit, and position 2 sets the most significant bit. Position 3 is reserved.

■ Table 2-2 CDI-4220 DSSI Node ID

	DSSI Node ID							
W5 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

DSSI Termination

While the CDI-4220 is equipped to provide on-board DSSI termination, CMD Technology recommends that you use external DSSI terminators supplied by Digital Equipment Corporation. If your system configuration requires on-board termination, put 120-ohm terminator resis-

tors in RP1 and RP2, 270-ohm resistors in RP3 and RP4 and remove the shunts from jumper W4.

■ **Table 2-3 CDI-4220 DSSI Termination Settings**

	On-Board Termination	External Termination
RP1 & RP2	110-ohm resistors IN	Empty
RP3 & RP4	270-ohm resistors IN	Empty
W4	OUT	IN

DSSI Term Power

Jumper W7 determines whether the CDI-4220 supplies term power to the DSSI bus. When the jumper shunt is installed, term power is supplied. Remove the jumper shunt to disable term power.

■ **Table 2-4 CDI-4220 DSSI Term Power**

Jumper W7	DSSI Term Power
IN	Supplied
OUT	Not supplied

Jumper W6 must be in its default position (with the shunt joining pins 2 and 3) when you want the CDI-4220 to supply term power on the DSSI bus.

SCSI Port (J10)

Figure 2-3 shows the components that determine the configuration of the SCSI port.

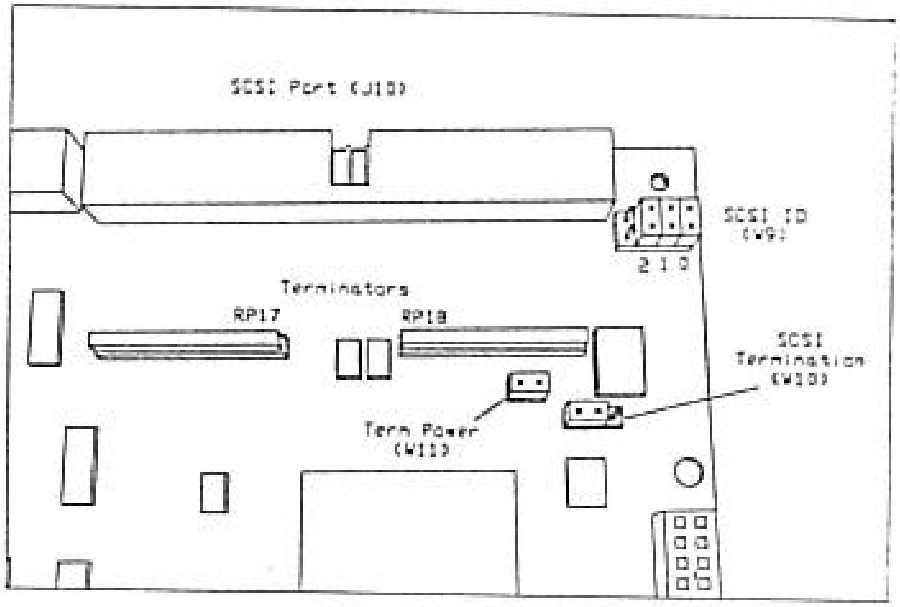

Fig. 2-3: CDI-4220 SCSI Port Configuration

SCSI ID

Jumper W9 determines the SCSI ID of the adapter. There are four positions on the jumper, labeled 0, 1, 2 and 3. Position 0 sets the least significant bit of the ID, position 1 sets the next significant bit, and position 2 sets the most significant bit. Position 3 is reserved.

■ **Table 2-5 CDI-4220 SCSI ID**

	SCSI ID							
W9 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

SCSI Termination

Like the DSSI bus, both ends of the SCSI bus must be terminated. By default, the CDI-4220's on-board SCSI terminators are installed. The adapter employs active termination on the SCSI bus. If you use on-board termination, you should use either active or FPT termination on the other end of the SCSI bus. Do not use passive termination.

The CDI-4220's SCSI termination consists of two 110-ohm resistors at RP17 and RP18. To install termination, insert the resistors. To remove termination, remove the resistors. If you remove the resistors, be sure to save them, in case you need to reinstall on-board termination.

SCSI Term Power

The CDI-4220 supplies term power to the SCSI bus by default. To prevent the adapter from supplying term power, remove the jumper shunt from W11.

■ Table 2-6 CDI-4220 SCSI Term Power

Jumper W11	SCSI Term Power
IN	Supplied
OUT	Not supplied

The shunt on jumper W10 always should be in its default position: joining pins 1 and 2. Changing the position of this jumper will prevent the adapter from properly directing term power to the SCSI bus.

Chapter 3

CDI-4240 Installation

CDI-4240 Components

Figure 3-1 shows the location of the CDI-4240's six DSSI/SCSI ports, as well as the most important configuration jumpers.

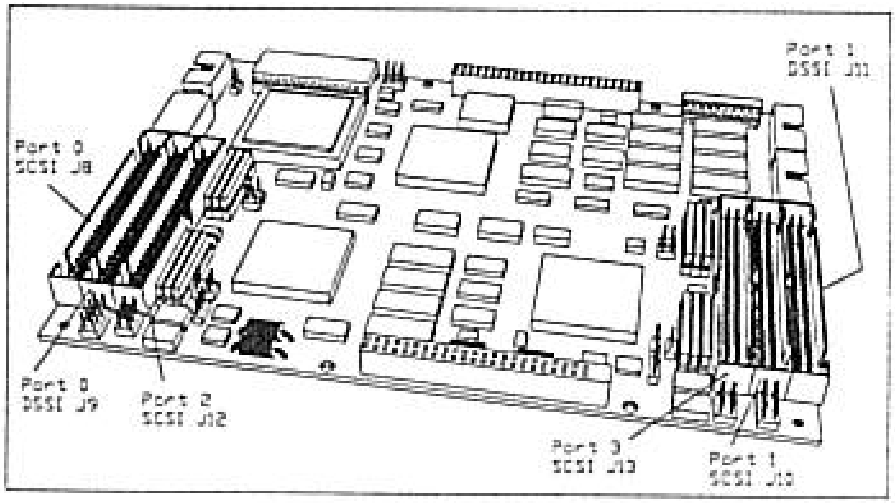

Fig. 3-1: CDI-4240 ports

Table 3-1 outlines the default configuration of the CDI-4240 adapter:

■ Table 3-1 CDI-4240 Default Configuration

Port 0 (J9)	Default
DSSI or SCSI	DSSI
DSSI Node ID or SCSI ID	7
On-board DSSI termination	No
Term power supplied	Yes
Port 1 (J11)	
DSSI or SCSI	DSSI
DSSI Node ID or SCSI ID	7
On-board DSSI termination	No
Term power supplied	Yes
Port 2 (J12)	
SCSI ID	7
On-board SCSI termination	Yes
SCSI term power supplied	Yes
Port 3 (J13)	
SCSI ID	7
On-board SCSI termination	Yes
SCSI term power supplied	Yes

You may change these default settings by manipulating the adapter's jumpers, as described in succeeding sections. The instructions for each port begin on the page numbers listed in Table 3-2.

■ Table 3-2 CDI-4240 Port Configuration Page Reference

Port 0 (J8/J9)	Page 3-3
Port 1 (J10/J11)	Page 3-6
Port 2 (J12)	Page 3-8
Port 3 (J13)	Page 3-10

Port 0

This section describes the configuration options for port 0.

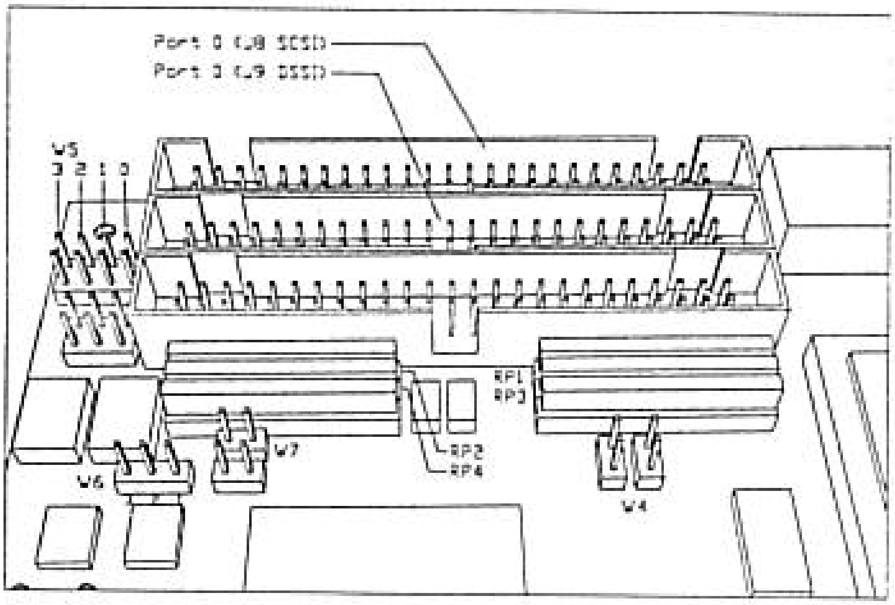

Fig. 3-2: CDI-4240 port 0

DSSI/SCSI Selection

Port 0 may be configured for DSSI or SCSI. The selector jumper is W5, position 3. If you configure port 0 for DSSI, use connector J9. If you configure port 0 for SCSI, use connector J8.

■ **Table 3-3 CDI-4240 Port 0 DSSI/SCSI Selection**

W5 Position 3	Port 0 Selection
IN	DSSI (J9)
OUT	SCSI (J8)

DSSI Node ID/SCSI ID

Depending on how you set position 3 on jumper W5, the remaining positions determine either the DSSI Node ID or the SCSI ID for port 0. Position 0 sets the least significant bit of the node ID, position 1 sets the next significant bit, and position 2 sets the most significant bit.

■ Table 3-4 CDI-4240 Port 0 DSSI Node ID/SCSI ID

	DSSI Node ID/SCSI ID							
W5 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

Termination

All DSSI and SCSI buses must be terminated at each end. If the CDI-4240 is at one end of a bus, you may use the adapter's on-board termination or extend the bus beyond the adapter and terminate with an external terminator. If the CDI-4240 is not at one end of a bus, be sure to remove on-board termination.

By default, port 0 is configured for DSSI without on-board termination. If you wish to install on-board termination for DSSI, follow these steps.

☐ Install 120-ohm terminator resistors at RP1 and RP2. Install 270-ohm resistors at RP3 and RP4.

☐ Remove the two shunts from jumper W4.

To remove on-board DSSI termination, simply reverse these steps. That is, you should:

☐ Remove terminator resistors from RP1, RP2, RP3 and RP4.

☐ Install two shunts on jumper W4.

If you configure port 0 for SCSI and decide to use on-board termination, follow these steps:

☐ Remove any DSSI resistors from RP1, RP2, RP3 and RP4.

☐ Insert 110-ohm resistors in RP1 and RP2.

If you wish to use external SCSI terminators or if the CDI-4240 is not at either end of the SCSI bus, simply make sure that RP1, RP2, RP3 and RP4 are depopulated.

The following table outlines the various termination choices you have for port 0.

■ Table 3-5 CDI-4240 Port 0 Termination Settings

	DSSI	SCSI
	On-Board Termination	**On-Board Termination**
RP1 & RP2	120 ohm	110 ohm
RP3 and RP4	270 ohm	Empty
W4	OUT/OUT	Irrelevant
	External Termination	**External Termination**
RP1 & RP2	Empty	Empty
RP3 and RP4	Empty	Empty
W4	IN/IN	Irrelevant

Termination Power

At least one host or device on a DSSI or SCSI bus must supply current to the terminators. The most desireable configuration is to have the two devices at the ends of the bus supply termination power, although no harm will come if more than two devices supply termination power.

Port 0 termination power options are determined by jumpers W6 and W7. Table 3-6 outlines the available options.

■ Table 3-6 CDI-4240 Port 0 Term Power Settings

	DSSI	SCSI
	Term Power Supplied	**Term Power Supplied**
W6	2-3 IN	1-2 IN
W7	IN	IN
	Term Power Not Supplied	**Term Power Not Supplied**
W6	2-3 OUT	1-2 OUT
W7	Irrelevant	Irrelevant

Port 1

This section describes the configuration options for port 1.

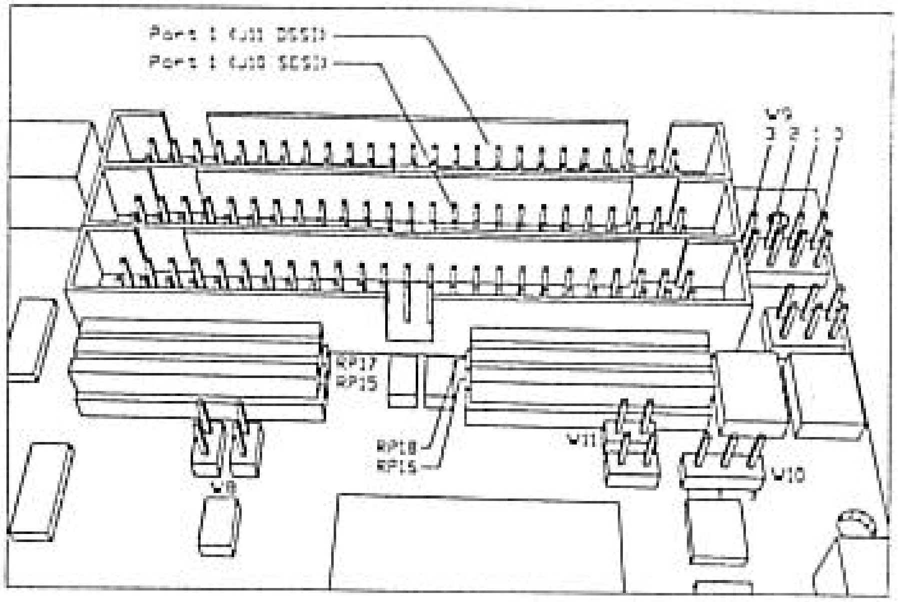

Fig. 3-3: CDI-4240 port 1

DSSI/SCSI Selection

Port 1 may be configured for DSSI or SCSI. The selector jumper is W9, position 3. If you configure Port 1 for DSSI, use connector J11. If you configure Port 1 for SCSI, use connector J10.

- **Table 3-7 CDI-4240 Port 1 DSSI/SCSI Selection**

W9 Position 3	Port 1 Selection
IN	DSSI (J11)
OUT	SCSI (J10)

DSSI Node ID/SCSI ID

Depending on how you set position 3 on jumper W9, the remaining positions determine either the DSSI Node ID or the SCSI ID for Port 1. Position 0 sets the least significant bit of the node ID, position 1 sets the next significant bit, and position 2 sets the most significant bit.

■ Table 3-8 CDI-4240 Port 1 DSSI Node ID/SCSI ID

	DSSI Node ID/SCSI ID							
W9 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

Termination

By default, Port 1 is configured for DSSI without on-board termination. If you wish to install on-board termination for DSSI, follow these steps.

- ☐ Install 120-ohm terminator resistors at RP17 and RP18. Install 270-ohm resistors at RP15 and RP16.
- ☐ Remove the two shunts from jumper W8.

To remove on-board DSSI termination, simply reverse these steps. That is, you should:

- ☐ Remove terminator resistors from RP17, RP18, RP15 and RP16.
- ☐ Install two shunts on jumper W8.

If you configure Port 1 for SCSI and decide to use on-board termination, follow these steps:

- ☐ Remove any DSSI resistors from RP17, RP18, RP15 and RP16.
- ☐ Insert 110-ohm resistors in RP17 and RP18.

If you wish to use external SCSI terminators or if the CDI-4240 is not at either end of the SCSI bus, simply make sure that RP17, RP18, RP15 and RP16 are depopulated.

Table 3-9 outlines the various termination choices you have for Port 1.

■ Table 3-9 CDI-4240 Port 1 Termination Settings

	DSSI	SCSI
	On-Board Termination	**On-Board Termination**
RP17 & RP18	120 ohm	110 ohm
RP15 and RP16	270 ohm	Empty
W8	OUT/OUT	Irrelevant
	External Termination	**External Termination**
RP17 & RP18	Empty	Empty
RP15 and RP16	Empty	Empty
W8	IN/IN	Irrelevant

Termination Power

Port 1 termination power options are determined by jumpers W10 and W11. Table 3-10 outlines the available options.

■ Table 3-10 CDI-4240 Port 1Term Power Settings

	DSSI	SCSI
	Term Power Supplied	**Term Power Supplied**
W10	2-3 IN	1-2 IN
W11	IN	IN
	Term Power Not Supplied	**Term Power Not Supplied**
W10	2-3 OUT	1-2 OUT
W11	Irrelevant	Irrelevant

Port 2

This section describes the configuration options for port 2, which is always configured for SCSI.

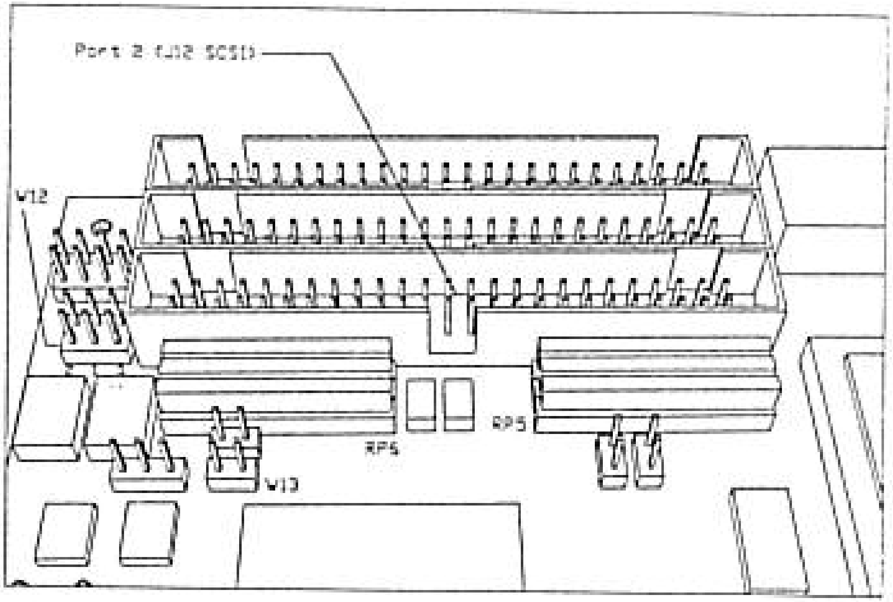

Fig. 3-4: CDI-4240 port 2

SCSI ID

Jumper W12 determines the SCSI ID for Port 2. Position 0 sets the least significant bit of the node ID, position 1 sets the next significant bit, and position 2 sets the most significant bit.

■ **Table 3-11 CDI-4240 Port 2 SCSI ID**

	SCSI ID							
W12 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

Termination

By default, on-board active SCSI termination is installed for Port 2. If you wish to use external termination or if the CDI-4240 is not at the end of the bus, you may prevent termination by removing the 110-ohm resistors at RP5 and RP6. Conversely, if you wish to use on-board termination, install 110-ohm resistors at RP5 and RP6.

■ **Table 3-12 CDI-4240 Port 2 Termination Settings**

	On-Board Termination	No Termination
RP5	110-ohm resistor IN	OUT
RP6	110-ohm resistor IN	OUT

Termination Power

Port 2 termination power is turned on and off by jumper W13.

■ **Table 3-13 CDI-4240 Port 2 Termination Power Settings**

	Term Power Supplied	Term Power Not Supplied
W13	IN	OUT

Port 3

This section describes the configuration options for port 3, which is always configured for SCSI.

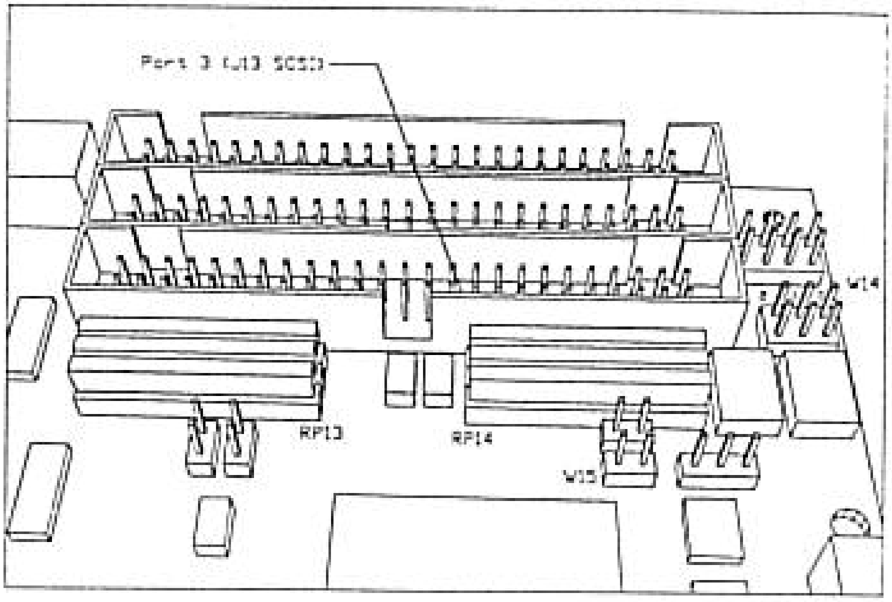

Fig. 3-5: CDI-4240 port 3

SCSI ID

Jumper W14 determines the SCSI ID for Port 3. Position 0 sets the least significant bit of the node ID, position 1 sets the next significant bit, and position 2 sets the most significant bit.

■ Table 3-14 CDI-4240 Port 3 SCSI ID

	SCSI ID							
W14 Position	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2 (MSB)	OUT	OUT	OUT	OUT	IN	IN	IN	IN
1 (NSB)	OUT	OUT	IN	IN	OUT	OUT	IN	IN
0 (LSB)	OUT	IN	OUT	IN	OUT	IN	OUT	IN

Termination

By default, on-board active SCSI termination is installed for Port 3. If you wish to use external termination or if the CDI-4240 is not at the end of the bus, you may prevent termination by removing the 110-ohm resistors at RP13 and RP14. Conversely, if you wish to use on-board termination, install 110-ohm resistors at RP13 and RP14.

■ Table 3-15 CDI-4240 Port 3 Termination Settings

	On-Board Termination	No Termination
RP13	110-ohm resistor IN	OUT
RP14	110-ohm resistor IN	OUT

Termination Power

Port 3 termination power is turned on and off by jumper W15.

■ Table 3-16 CDI-4240 Port 3 Termination Power Settings

	Term Power Supplied	Term Power Not Supplied
W15	IN	OUT

Chapter 4

Cache Module

Installation

The optional cache module (the CDI-4204) is designed to plug into connectors J2 and J3 on the Cobra. The module and the connectors are "keyed" to guarantee proper installation. Figure 4-1 shows the cache module properly installed on the CDI-4220.

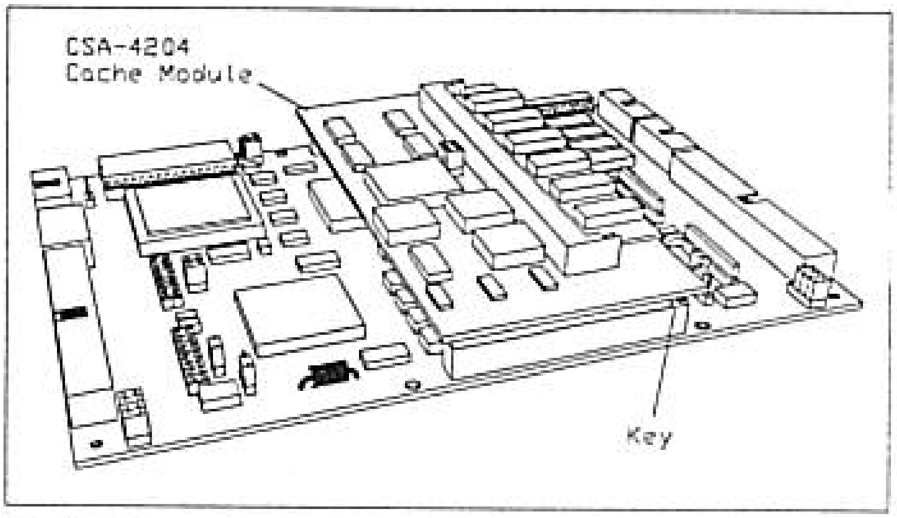

Fig. 4-1: CDI-4204 cache module

SIMM Specifications

The CDI-4204 will accept 4, 8, 16 and 32 megabyte SIMMs. It will also accept 64 and 128 megabyte SIMMs when they become available. When you purchase a SIMM for the cache module, be sure it adheres to the following specifications:

■ **Table 4-1 CDI-4204 SIMM Specifications**

Pins	72
Bits	36
Speed	70 nanosecond

SIMM Size Selector

For the cache module to operate properly, you must specify the size of the SIMM you have installed. This is done by setting jumper W1 on the cache module.

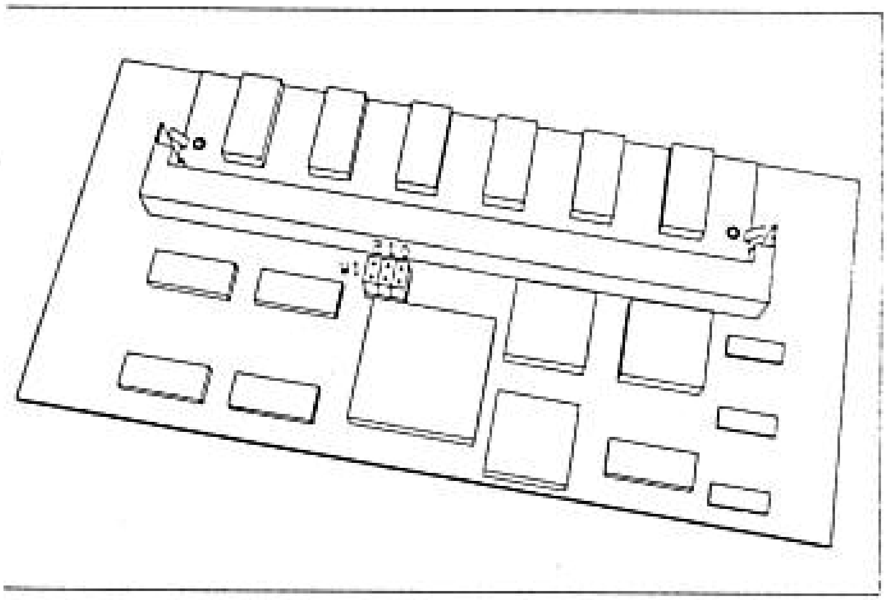

Fig. 4-2: CDI-4204 SIMM size selector (W1)

■ **Table 4-2 CDI-4204 Jumper W1 (SIMM Size)**

SIMM Size	W1(2)	W1(1)	W1(0)
4MB	IN	IN	IN
8MB	IN	OUT	OUT
16MB	IN	IN	IN
32MB	OUT	IN	OUT
64MB	IN	IN	IN
128MB	OUT	OUT	OUT

Chapter 5

Front Panel

The front panel display provides a constantly updated glimpse at the devices connected to the Cobra. In addition, you may use the front panel display and the front panel buttons to modify the Cobra's operational parameters. This chapter describes the operation and function of the front panel display.

Status Display

During normal operation, the front panel display cycles through all the devices connected to the Cobra in a continuous loop. When information about the last device is flashed on the screen, the display returns to the first device and begins the cycle all over again.

For each device, the display shows two screens of information. The top line on both screens identifies the physical device name of the subject SCSI device and the nodename of the Cobra. The difference between the two screens is apparent on the second line, which identifies the device manufacturer, model number and revision number on the first screen and the SCSI ID, logical unit number (LUN), device status and write protection status on the second screen.

The first screen will look something like the following example.

```
S4SDUA1010    (COBRA)
FUJITSU M2694ES 386E
```

The left side of the top line identifies the physical device name of the particular device. On the right side of the top line is parenthesis is the nodename of the Cobra. The second line displays the device manufacturer's name, the device model number and the revision number of the device's firmware.

The second screen for the same device might look like this.

```
S4SDUA1010    (COBRA)
ID=1 LUN=0 ONLNE R/W
```

The second line on this screen begins on the left with the SCSI ID of the device, followed by the LUN. Next comes the device status, and the last entry indicates whether the device is enabled for read/write access for for read-only access.

Modifying Parameters from the Front Panel

To switch from the status display to the setup menu, press the SEL button a single time. Once you enter the setup menu, use the arrow buttons to move up and down through the menu tree or change a parameter value. Use the SEL button to select a branch of the menu tree or accept a new value for a parameter. The EXIT button exit a menu branch or aborts a modification of a parameter.

The following example shows how the front panel buttons are used to move through the menu and change the MSCP unit number for the device on port 1, SCSI ID 2. The example begins with the display in normal status mode.

■ Table 5-1 Front Panel Parameter Change Example

Action	Result
	Status display
SEL	Setup Menu [SYS PARAMS]
↓	Setup Menu [DEV PARAMS]
SEL	Select Port (0-3) [0]
↑	Select Port (0-3) [1]
SEL	Select Unit (0-7) [0]
↑	Select Unit (0-7) [1]
↑	Select Unit (0-7) [2]
SEL	Set ID-2's Status to [ONLINE]
↓	Set ID-2's Caching Status to [ON]
↓	Set ID-2's Disk Device Type [DIA]
↓	Allow ID-2 to Disconnect [YES]
↓	Fast Tapemark Search on ID-2 [NO]
↓	Use Immediate Bit on ID-2 [YES]
↓	Set ID-2's MSCP/TMSCP ID to [120]
SEL	Set ID-2's MSCP/TMSCP ID to [120]
↑	Set ID-2's MSCP/TMSCP ID to [220]

Action	Result
SEL	Set ID-2's MSCP/TMSCP ID to [220]
↑	Set ID-2's MSCP/TMSCP ID to [230]
SEL	Set ID-2's MSCP/TMSCP ID to [230]
↓	Set ID-2's MSCP/TMSCP ID to [23_]
↓	Set ID-2's MSCP/TMSCP ID to [239]
SEL	Set ID-2's MSCP/TMSCP ID to [239_]
SEL	Set ID-2's MSCP/TMSCP ID to [239]
EXIT	Select Unit (0-7) [0]
EXIT	Setup Menu [DEV PARAMS]
EXIT	Status display

The front panel display offers most of the functions found in DUP. There are some differences, however. Instead of identifying parameters by keywords, the front panel uses descriptive phrases in a menu structure. The front panel does not support the asterisk (*) wildcard character for selecting multiple ports or IDs. In addition, the ADD and SUBTRACT device parameters are not available on the front panel. There is no REFRESH command on the front panel, but you can achieve the same result by EXITing to the status display without SELecting WRITE. When you return to the setup menu, your changes will be lost and the values displayed will reflect the current configuration record.

Table 5-2 lists the key phrases found on the front panel setup menu and their corresponding DUP parameters. The table also includes references to chapter 8, where you can find more information about these parameters.

■ **Table 5-2 Front Panel and DUP Parameters**

Front Panel Phrase	DUP Parameter
System Parameters	See page 8-4
System ID	SYSTEM_ID
System Node Name	NODENAME
Disk Allocation Class	DISK_ALCS
Tape Allocation Class	TAPE_ALCS
Maximum Hosts	MAX_HOSTS
Maximum Cached Units	MAX_CACHED_UNITS
Port Parameters	See page 8-6
Set Port-X's Scan Type to	SCANNING
Set Port-X's Scan Rate to	SCAN_RATE
Enable Power On Reset on Port-X	POWER_ON_RESET
Device Parameters	See page 8-7
Set ID-X's Status to	ONEB
Set ID-X's Caching Status to	CACH
Set ID-X's Disk Device Type	TYPE

Front Panel Phrase	**DUP Parameter**
Allow ID-X to Disconnect	DISC
Fast Tapemark Search on ID-X	FTMS
Use Immediate Bit on ID-X	IMMD
Set ID-X's MSCP/TMSCP ID to	UNIT
Use Short Tapemarks on ID-X	SHTM
Spin Down on ID-X on Dismount	SPIN
Sync Rate for ID-X	SYNC
Use Tagged Commands on ID-X	TAGQ
Write Protect ID-X	WPRT
Use Truncated Disk Volume on ID-X	TRNC

WRITE

You do not need to perform a WRITE after you change the ONEB, WPRT and CACH parameters. Changes to these parameters take effect immediately.

When you use the front panel's setup menu to change a parameter value, you are actually editing a duplicate of the current configuration record, which contains the parameters that control the Cobra. The changes you make to the duplicate do not become part of the current configuration record until you WRITE the duplicate to the Cobra's non-volatile random access memory (NOVRAM) and reinitialize the Cobra by issuing the RESTART command or by recycling power.

Be sure to follow up the WRITE command with RESTART to initialize your changes.

FACTORY

The FACTORY command restores all parameters in the duplicate configuration record to their factory default values. To make the factory defaults the current operating parameters, you must perform the WRITE/RESTART procedure.

RESTART

Use the RESTART command to reinitialize the Cobra after you have changed parameters from the front panel and saved them to the NOVRAM with the WRITE command. You do not need to perform a RESTART when you change the ONEB, CACH or WPRT parameters. Changes to these parameters take effect immediately.